

DRUG CHEMISTRY SECTION TECHNICAL PROCEDURE MANUAL		
Procedure K-1	Random Sampling Random Sampling of Multiple Packages or Units	
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Name of Procedure:

Random Sampling
Random Sampling of Multiple Packages or Units

Suggested Uses:

Random sampling is a procedure that is used when analyzing an item of evidence that consists of multiple packages or units. This procedure allows a chemist to determine the composition of the evidence by analyzing some randomly selected packages or units and extrapolating the results. Random sampling is an accepted procedure used in forensic science and has been upheld by the Appellate Courts of North Carolina (see literature references).

Random Sampling Procedures:

A. Plant Material

1. Visually examine all of the packages or units in the item of evidence, as well as the contents, for differences in size, weight, color, packaging, markings, signs of tampering, labeling or other characteristics.
 - a. If there are no appreciable differences, all of the packages or units should be considered together for the selection of the random sample.
 - b. If there are appreciable differences, segregate the packages or units into individual groups, based upon such observed differences. A random sample can then be obtained from each group.
 - c. If no groups can be formed based upon visual examination, then random sampling is not performed.
2. Identification requirements (minimum requirements).
 - a. A macroscopic examination of all packages or units.
 - b. A complete analysis of one package or unit indiscriminately selected from all packages or units.
3. Weight determination and weight count requirements. The total weight of all packages or units may be extrapolated from the weight of a random sample of the packages or units. The total number of all packages or units may be extrapolated from the weight of a random sample of the packages or units.
 - a. To determine the number of random samples to be selected from a total number of packages or units, where n equals the total number of packages or units:

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1. If **n** is less than or equal to 4, then random sampling is not done.
2. If **n** is greater than or equal to 5, then the number of random samples selected is equal to the square root of **n** plus 1, expressed as:

$$\text{random samples} = \sqrt{n} + 1$$

- b. Packages or units selected as part of the random sample should be selected indiscriminately from all packages or units.
- c. If the weight or the number of packages or units falls within + /- 10 % of a penalty level, then random sampling is not utilized to determine the weight or the number of packages or units.

B. Marked dosage units from pharmaceutical manufacturers

1. Visually examine all of the packages or units in the item of evidence, as well as the contents, for differences in size, weight, color, packaging, markings, signs of tampering, labeling or other characteristics.
 - a. If there are no appreciable differences, all of the packages or units should be considered together for the selection of the random sample.
 - b. If there are appreciable differences, segregate the packages or units into individual groups, based upon such observed differences. A random sample can then be obtained from each group.
 - c. If no groups can be formed based upon visual examination, then random sampling is not performed.
2. Identification requirements (minimum requirement).
 - a. Visual examination and sufficient Pharmaceutical Identifiers on all dosage units.
 - b. A complete analysis of one dosage unit indiscriminately selected from all dosage units.
3. Weight determination and weight count requirements. The total weight of all packages or units may be extrapolated from the weight of a random sample of the packages or units. The total number of all packages or units may be extrapolated from the weight of a random sample of the packages or units.
 - a. To determine the number of random samples to be selected from a total number of packages or units, where **n** equals total number of packages or units:
 1. If **n** is less than or equal to 4, then random sampling is not done.
 2. If **n** is greater than or equal to 5, then the number of random samples selected is equal to the square root of **n** plus 1, expressed as:

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$$\text{random samples} = \sqrt{n} + 1$$

- b. Packages or units selected as part of the random sample should be selected indiscriminately from all packages or units.
- c. If the weight or the number of packages or units falls within + /- 10 % of a penalty level, then random sampling is not utilized to determine the weight or the number of packages or units.

C. Substances derived from clandestine manufacturers.

1. Substances derived from clandestine manufacturers include:
 - a. Packages or units containing powders, solids or liquids.
 - b. Packages or units consisting of any substance which is used as a medium to absorb or contain a controlled substance (individual blotter paper, gelatin, sugar cubes, tea leaves, parsley, etc.)
 - c. Clandestinely manufactured tablets.
2. Visually examine all of the packages, units or tablets in the item of evidence, as well as any contents, for differences in size, weight, color, packaging, markings, signs of tampering, labeling or other characteristics.
 - a. If there are no appreciable differences, all of the packages, units or tablets should be considered together for the selection of the random sample.
 - b. If there are appreciable differences, segregate the packages, units or tablets into individual groups, based upon such observed differences. A random sample can then be obtained from each group.
 - c. If no groups can be formed based upon visual examination, then random sampling is not performed.
3. To determine the number of random samples to be selected from a total number of packages or units, where n equals total number of packages or units:
 - a. If n is less than or equal to 4, then random sampling is not done.
 - b. If n is greater than or equal to 5, then the number of random samples selected is equal to the square root of n plus 1, expressed as:

$$\text{random samples} = \sqrt{n} + 1$$

- c. Packages, units or tablets selected as part of the random sample should be selected indiscriminately from all packages, units or tablets.
4. Identification Requirements.
 - a. Each of the randomly selected packages, units or tablets must be

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subjected to at least one screening test.

1. The screening test should be selected to aid in the identification of any controlled substances that may be present and should have a positive result.
2. In the event that a positive screening test result cannot be obtained, multiple negative screening tests may be used to establish the uniformity of the packages, units or tablets. The screening tests should be appropriately selected to screen for a suitable range of controlled substances.
- b. A complete analysis of one package, unit or tablet indiscriminately selected from all packages or units.
5. Weight determination and weight count requirements. The total weight of all packages or units may be extrapolated from the weight of a random sample of the packages or units. The total number of all packages or units may be extrapolated from the weight of a random sample of the packages or units.
 - a. If the weight or the number of packages, units or tablets falls within + /- 10 % of a penalty level, then random sampling is not utilized to determine the weight or the number of packages or units.

Safety Concerns:

Not applicable.

Literature References:

Colon, Rodriguez, and Diaz, "Representative Sampling of 'Street' Drug Exhibits," Journal of Forensic Sciences, Vol. 38, No. 3, May 1993, pp. 641-648.

Siegel, and Saferstein, "Forensic Identification of Controlled Substances," Forensic Science Handbook, Vol. 2, Prentice Hall, 1988.

Tzidony and Ravreby, "A Statistical Approach to Drug Sampling: A Case Study," Journal of Forensic Sciences, Vol. 37 November, 1992, pp. 1541-1549.

Frank, Hinkley, and Hoffman, "Representative Sampling of Drug Seizures in Multiple Containers," Journal of Forensic Sciences, Vol. 36, March 1991, pp. 350-357.

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State v. Myers, 301 S.E. 2d 401, 402 (N.C. App. 1983)

State v. Wilhelm, 296 S.E. 2d 664, 667 (N.C. App. 1982)

State v. Absher, 237 S.E. 2d 1325, 1328 (N.C. App. 1977)

State v. Clark, 197 S.E. 2d 81, 82 (N.C. App. 1973)

State v. Riera, 172 S.E. 2d 535, 539 (N.C. App. 1970)

State v. Harding, 429 S.E. 2d 416 (N.C. App. 1993)

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